The University of Minnesota

AGRICULTURAL EXTENSION DIVISION

Special Bulletin No. 41

University Farm, St. Paul May, 1919

Published by the University of Minnesota, College of Agriculture, Extension Division, A. D. Wilson, Director, and distributed in furtherance of the purposes of the cooperative agricultural extension work provided for in the Act of Congress of May 8, 1914.

MAKING CIDER AND CIDER VINEGAR

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Sweet cider is easily made and usually can be sold readily if of good quality. Very good quality can be secured by using suitable varieties of apples and by paying attention to several simple but important details in the process of grinding and pressing.

USE RIPE APPLES

Apples used for cider should be well ripened, not over-ripe or green. When fully ripe, apples contain the greatest quantity of juice and the sugar content and flavor are generally at the highest point of development. If the apples have developed properly in sugar content and flavor, the resulting cider will be of much better flavor and quality than cider from the same variety, either when green or when over-ripe. A fairly accurate estimate of the value of any apple variety for cider making is found in the quality of the apple itself. Varieties with a pleasant, attractive flavor and either sweet or sub-acid will make a cider of similar character, whereas a variety characteristically sour, puckery, or flat will yield a cider of the same nature.

Recent investigations have shown that the best varieties for sweet cider are Anisim, Charlamoff, Lowland Raspberry, Okabena, Talman (Sweet), Wealthy, and Whitney (No. 20). Varieties which will yield cider of fair quality are Antonovka, Cross, McMahon, Northwestern (Greening), Peerless, Swaar, University, Utter (Red), and Wolf River. Cider from these will not be of quite as high quality as cider from the varieties in the first list, but none of them yield a cider of poor quality. Cider from Duchess (Oldenburg), Hibernal, Longfield, and Patten (Greening) generally is of poor quality or too sour.

SORTING AND WASHING

The apples should be sorted before grinding in order to discard worm-eaten and decaying ones. Decayed spots in otherwise usable apples may be cut away if it is desirable to make use of the sound portion. The amount of time and help available will determine if this can be done. To include decayed or wormy fruit will spoil the flavor of the cider. It is advisable to wash the apples before grinding. If they are dirty, washing is necessary to avoid an earthy flavor in the cider, and washing will always remove a considerable quantity of dirt which is not evident in a casual examination. Discarding the culls and washing the good apples in an old washtub will take very little time. To cut out decayed spots will take a little longer, but may be worth the trouble at times when apples are scarce.

GRINDING

After sorting and washing, the apples are ready for grinding. If possible, work in a screened room to avoid flies, and wash the press occasionally with clean water, as cleanliness is one of the chief factors leading to success in cider making. Any type, size, or make of hand-operated machine can be used. However, the size of the machine should be proportionate to the quantity of fruit to be used. Adjust the grinders so that the apples will be ground as finely as possible in order to secure the maximum yield of juice. Coarsely ground particles will not give up all the juice in them when pressed.

PRESSING

When pressing, work the screw in the press down as far as it will go. If a barrel or drum press is used, it may be found best to use a clean grain sack to confine the pomace, as this will prevent the rather unpleasant "squirting" of pomace from the drum and make it possible to apply effectively a much greater pressure. To catch the cider, either wooden or common enamel pails should be used, as the acid in the cider may act upon tin or iron, producing undesirable flavors or discoloration of the cider. Forty pounds of apples (a bushel basket full) will yield from 2 to 3 gallons of cider, depending on the variety and the grinding and pressing.

HANDLING SWEET CIDER

Pour cider into clean barrels or casks, using a funnel and strainer. It is important to use clean casks, either new or sterilized with steam, as old or dirty containers will add undesirable flavors to the cider. For immediate sale as sweet cider there is nothing more to be done except market the cider. If it is desired to prevent fermentation for a short time it is permissible to add one-tenth of one per cent benzoate of soda to the cider, if for bulk handling. The use of this preservative is not permissible in bottled ciders. Whenever a ready market can be found for sweet cider this generally will be found the most convenient method for the disposal of it.

HANDLING CIDER FOR VINEGAR MAKING

If the cider is to be made into vinegar there are several steps which are essential and which must be followed carefully to insure the desired results. After pressing, the cider should be put in new or sterilized barrels, filling the barrels not more than two thirds or three fourths full in order that air may have access to the cider. The bunghole should then be loosely plugged with cotton, preferably contained in cheesecloth to facilitate handling. This will admit air and keep out insects and dust. If better air circulation is desired, inch holes can be bored in each head at the top and these holes plugged with cotton or covered with fine mesh wire screen.

Alcoholic Fermentation

The first fermentation or "working" of the cider may often be accelerated by adding to each five gallons of cider one cake of compressed yeast. The yeast should be mixed smoothly with water or cider, and after it is poured into the cider in the barrel they should be mixed thoroly. Enough wild yeast may at times get into the cider that the addition of more yeast may have little or no effect, but the addition is relatively inexpensive, does no harm, and generally will make the fermentation certain. This first working is caused by the action of yeast changing the sugars in the cider to alcohol and is often called the alcoholic fermentation to distinguish it from the subsequent vinegar fermentation. This fermentation will go on most satisfactorily if the temperature is kept between 65 and 75 degrees, Fahrenheit. The action will be very rapid

for a time but will gradually quiet down and in a few weeks will have ceased. The barrels of cider can be kept in a sunny place while this fermentation is going on. Outdoor temperatures in September and early October are higher than cellar temperatures and the fermentation will proceed more rapidly than in a cellar unless the cellar is heated.

Rack Into Clean Barrels

When the cider is quiet the clear liquid should be "racked" or siphoned off into clean barrels in order to get rid of the sediment. This sediment may not be harmful, but at times it does seriously interfere with the proper behavior of the cider and it is always best to be rid of it at this stage. If the cider has been kept outdoors, this racking gives an excellent opportunity for getting it into the cellar by easy stages in pails and avoiding the handling of heavy barrels. The clear liquid, now in the stage generally known as "hard cider," should be run into steriilized or new barrels, filling as before not more than three fourths full, and the bunghole closed with a cotton plug. Do not, under any circumstances, use a barrel which previously has been used for vinegar without thoroly sterilizing it with steam or boiling water. An old barrel commonly contains bacteria and molds which may cause very objectionable flavors or actually destroy the acetic acid of the vinegar, leaving a worthless liquid.

Acetic Fermentation

At this stage of the process the alcohol in the hard cider is changed by the action of vinegar-forming bacteria into acetic acid, which gives the characteristic sour taste to vinegar. To secure the best results the liquid should be kept, as before, at a temperature between 65 and 75 degrees, Fahrenheit. The formation of acid goes on more rapidly at these higher temperatures than would be the case if the cider were kept in a cold cellar, the finished vinegars commonly being ready for use or sale within six months from pressing. If kept cold, the full strength of the vinegar may not be reached for a much longer time. In experiments conducted at University Farm, vinegar of standard strength (4 per cent acetic acid) was frequently secured in two and a half months. Long storage is not a sure means of securing standard strength, as some varieties will not gain vinegar strength in this way.

Value of a Vinegar "Starter"

The change from alcohol to acetic acid may be accelerated also by adding to the cider a small quantity of good quality vinegar as a "starter." Authorities differ somewhat as to how much vinegar to use, but from two to four quarts for thirty gallons will generally be sufficient, and good vinegar has been obtained at this Station by using as little as one pint to thirty gallons, altho there is no evidence that this result was due entirely to the starter. The object in adding the vinegar is to be certain that some of the vinegar-forming bacteria will be present in the barrel. Enough bacteria may get into the cider by natural means to cause a very satisfactory fermentation, but as in adding yeast to the sweet cider, the vinegar starter makes the proper fermentation more certain.

VARIETY RECOMMENDATIONS

Apple varieties grown in Minnesota have been tested to determine their value for vinegar making, and it is now possible to group the varieties into classes on this basis.

Varieties which can be considered dependable for vinegar making are: Anisim, Charlamoff, Cross, Hibernal, McMahon, Maiden Blush, Okabena, Swaar, Talman (Sweet), Utter (Red), Virginia (Crab), Wealthy, and Wolf River. All of these should produce vinegar of standard strength, used either separately or in a mixture with others of the group.

Varieties which apparently will not produce standard vinegar in cask fermentation are : Duchess (Oldenburg), Excelsior, Florence (Crab), Longfield, Red Wine, and Whitney (No. 20). Patten (Greening) probably should be included in this list, as it has behaved very erratically, generally not producing a standard vinegar.

Antonovka, Gilbert, Northwestern (Greening), Peerless, University, and Yellow Transparent may produce vinegar strong enough for home use, but not of marketable strength, and they are not safe varieties to use if the vinegar is to be sold.

HANDLING THE FINISHED VINEGAR

When the vinegar has reached the point where a test will show at least 4 per cent of acetic acid, the clear liquid should be racked off into clean barrels. This time the barrels should be filled full, the bung driven in tight to exclude air, and then placed in a cold cellar. In this way any further action in the liquid is checked and the vinegar kept from spoiling.

TEST VINEGAR BEFORE SELLING

The vinegar may be sold at any time after the fermentation is complete, but if sold in quantity it should be tested to see if it has the proper strength as required by law. The law in Minnesota requires that vinegars offered for sale shall contain at least 4 per cent of acetic acid. The tests may be made by the vinegar maker if he so desires, but the State Dairy and Food Commission will test free of charge all samples sent to them, or deputized inspectors may call if a request is sent to the Commission. There are provisions in the law specifying the amounts of solids and ash which the vinegar must contain, but any vinegar properly and honestly made will meet the requirements on these points.

COST OF PRODUCTION

Considering all the items of cost, sweet cider can be produced for from 16½ to 24 cents per gallon, the exact cost depending upon the value of the apples, the cost of handling and pressing, the yield, interest and depreciation charges on equipment, and the cost of marketing. Good management usually can keep the cost figure close to the minimum given above. With sweet cider generally selling for about 40 cents per gallon, a fair margin of profit is possible from cull apples which usually are considered of little or no value.

In vinegar making the cost will run a cent or two per gallon higher than for sweet cider, but the product is more durable.

SWEET CIDER OR VINEGAR?

If vinegar making costs a cent or two more per gallon than sweet cider, it is evident that the advantage in selling lies with the sweet cider as the returns come more quickly and the net profit will be a little higher. Also, there will not be the necessity of watching the vinegar-making process and guarding against unfavorable conditions in the cellar. However, to make the cider into vinegar gives the possibility of a sale when no market can be found for sweet cider. As sweet cider can not be kept long, the marketing time is necessarily limited and this more or less limits the quantity which can be produced with safety. In contrast to this, good vinegar will keep for a long time if handled properly, so there is practically no limit to the marketing time. For this reason a much larger quantity can be made with reasonable assurance that all can be sold. The apple grower must decide which product best meets his conditions. A ready market usually can be built up for either sweet cider or vinegar and the grower can thereby secure a profitable method of disposal for a poor grade of fruit, which might otherwise be wasted.